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Overview of I/M Activities and Issues

By

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16. ABSTRACT

This paper summarizes the national implementation status of Inspection and Maintenance (I/M) programs, describes the current issues in operating programs, and briefly explains the current EPA I/M projects and other I/M aspects receiving special attention. In summary, there are currently twenty-one operating I/M programs with another seven scheduled to be implemeted by August 1984. EPA is continuing to provide technical support to State and local agencies which are implementing and operating I/M programs. EPA's major role on I/M at this time is to assist the States inoptimizing the quality of their I/M programs.

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OVERVIEW OF I/M ACTIVITIES AND ISSUES

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The 1977 Clean Air Act Amendments require motor vehicle inspection/maintenance (I/M) programs in many areas which could not attain the air quality standards for ozone or carbon monoxide by the end of 1982. To date, twenty-one programs have been successfully implemented across the United States with another seven programs scheduled to be implemented in the next six months. Current issues in operating programs include non-compliance among vehicle owners in some regionalized programs with sticker enforcement, low reported failure rates in some decentralized programs, and seemingly excessive waiver rates in some programs.

EPA has traditionally provided and is continuing to provide technical support to those States which are operating or implementing I/M programs. This support includes the development of effective enforcement and quality assurance procedures. In addition, EPA is continuing to evaluate the effectiveness of I/M programs, especially with respect to the recent emission control technology characteristics of the 1981 and newer model year vehicles. Other current EPA projects involve evaluating the effects of misfueling and tampering on vehicle emissions and developing a national audit procedure for I/M programs.

There are several other aspects of I/M programs which are receiving or soon will be receiving special attention. Several States are incorporating I/M requirements for

heavy-duty vehicles in order to address equity issues or to gain additional emission reduction credits. Also many States are now considering what changes may be necessary for their programs to comply with the I/M-related emission performance warranty [207(b)] requirements. A new 207(b) rulemaking is presently in EPA steering committee review, and EPA is planning a major 207(b) initiative after the rulemaking is published in the Federal Register.

This paper was presented at the Air Pollution Control Association's specialty meeting in Kansas City, Missouri on February 15, 1984.

OVERVIEW OF I/M ACTIVITIES AND ISSUES

Background

The requirement for motor vehicle inspection/maintenance (I/M) programs stems from the 1977 Clean Air Act Amendments (CAAA). The CAAA generally require that all nonattainment areas meet the National Ambient Air Quality Standards by 1982. Recognizing that there were significant problems in many areas with the transportation related pollutants ozone and carbon monoxide, Congress included a provision for attainment deadline extensions until 1987 for these two pollutants. However, areas receiving such extensions were required to meet certain conditions, including in most areas, the requirement to implement an I/M program.

EPA policy limited the I/M requirement to urbanized areas with populations of 200,000 or greater. Nevertheless, I/M has been required in several cities with smaller populations because of their inability to demonstrate attainment by 1987 without an I/M program. Altogether, I/M programs were required in thirty States and the District of Columbia as a result of the CAAA. Except for those programs in the cities with populations under 200,000, the I/M implementation deadline established by EPA was December 31, 1982.

Implementation Status

The current implementation status of I/M programs nationally is presented in Table I. The information included in Table I identifies: 1) the States requiring I/M; 2) the I/M areas within each State; 3) the type of I/M program in each State; and 4) the start date or the scheduled start date of each program. For ease in following the list geographically, the States are listed in order starting in the Northeast and progressing across the county to the Northwest.

As displayed in Table I, there are currently twenty-one operating I/M programs across the county. Of these, ten programs are decentralized (seven of which were combined with or related in some way to existing safety inspection programs), six are centralized programs operated by contractors, four are centralized programs operated by the State or local government (three combined with existing safety inspection programs), and one is a combined decentralized and State-run centralized program. The longest running program was started in New Jersey in February 1974, and the newest program is in the Maryland program which started in February 1984. All but four programs have started since December 1981.

TABLE I. I/M PROGRAM IMPLEMENTATION STATUS AS OF FEBRUARY 15, 1984

State/Areas	Program Type	Start Date
Massachusetts statewide	Decentralized	April 1983
Rhode Island statewide	Decentralized	January 1979
Connecticut statewide	Centralized Contractor	January 1983
New York New York City metro area	Decentralized	January 1982
New Jersey statewide	Combined Decentralized and Centralized State-Run	February 1974
Pennsylvania Philadelphia Pittsburgh Allentown	Decentralized	June 1984
Delaware Wilmington	Centralized State-Run	January 1983
Maryland Baltimore DC suburbs	Centralized Contractor	February 1984
Dis. of Columbia Area-wide	Centralized City-Run	January 1983
Virginia DC suburbs	Decentralized	December 1981
North Carolina Charlotte	Decentralized	December 1982
Georgia Atlanta	Decentralized	April 1982
Tennessee Memphis Nashville	Centralized City-Run Centralized Contractor	August 1983 July 1984

TABLE I. (CONT'D) I/M PROGRAM IMPLEMENTATION STATUS AS OF FEBRUARY 15, 1984

State/Areas	Program Type	Start Date
Kentucky		
Louisville	Centralized Contractor	January 1984
Cincinnati suburbs	unknown	unknown
Ohio	unknown	unknown
Cincinnati		
Cleveland		
Michigan	unknown	unknown
Detroit		
Indiana	Centralized State-Run	June 1984
Chicago suburbs		
Louisville suburbs		
Illinois	unknown	unknown
Chicago		
East St. Louis		
Wisconsin	Centralized Contractor	April 1984
Milwaukee		
Missouri	Decentralized	January 1984
St. Louis		
Texas	Decentralized	January 1983; expansion- April 1984
Houston		
New Mexico	Centralized Contractor	January 1983
Albuquerque		
Colorado	Decentralized	January 1982
Denver		
Ft. Collins		
Colorado Springs		
Utah	Decentralized	May 1984
Salt Lake City		
Arizona	Centralized Contractor	January 1977
Phoenix		
Tucson		

TABLE I. (CONT'D) I/M PROGRAM IMPLEMENTATION STATUS AS OF FEBRUARY 15, 1984

State/Areas	Program Type	Start Date
Nevada	Decentralized	October 1983
Las Vegas		
Reno*		
California	Decentralized	March 1984
Los Angeles		
Ventura		
San Diego		
San Francisco		
Sacramento		
Fresno		unknown
Oregon		
Portland	Centralized State-Run	July 1975
Medford*		unknown
Idaho		
Boise*	Decentralized	August 1984
Washington		
Seattle	Centralized Contractor	January 1982
Spokane*	unknown	unknown
Alaska	unknown	unknown
Anchorage*		(1985)
Fairbanks*		

*Areas under 200,000 population.

As shown in Table I, over the next six months, seven additional I/M programs will be starting at the rate of about one new program per month. Of these seven programs, four will be decentralized programs, two will be centralized contractor operations, and one will be a centralized State-run program. Table II contains a list of these planned programs arranged in chronological order by their scheduled start dates.

TABLE II. I/M PROGRAMS SCHEDULED TO BEGIN LATER IN 1984

State	Start Date
California All areas except Fresno	March 1984
Wisconsin	April 1984
Utah	May 1984
Pennsylvania	June 1984
Indiana	June 1984
Tennessee (Nashville)	July 1984
Idaho	August 1984

The remaining four States (Illinois, Michigan, Ohio, and Alaska) and Fresno County, California are classified as "unknowns" in Table I. All of these areas are behind schedule on I/M implementation. Illinois, Michigan, and Fresno County, California are areas which EPA believes are not complying with the requirements of the CAAA. For that reason, EPA has in each case begun the consultation process required before EPA can impose transportation funding limitations under Section 176(a) of the Act.

Ohio and Alaska are also behind schedule but involve different situations. Alaska's two I/M areas are both small cities with significant carbon monoxide problems. The particularly cold climate and other factors unique to Alaska required a special feasibility study which has just been completed. Because of this, EPA expects to receive a final I/M plan from Alaska very soon.

In Ohio, both Cincinnati and Cleveland experienced dramatic air quality improvements in 1980 and 1981. This situation caused the State to be able to demonstrate attainment by the end of 1982 in both cities in its 1982

revision to the Ohio State Implemenation Plan and, thus, negate the need for an I/M program. However, 1983 air quality data has shown that both areas actually remain in nonattainment. Based on this new evidence, EPA has recently notified the State that an I/M program must be implemented.

Two other areas (Medford, Oregon and Spokane, Washington) are also listed as "unknowns" in Table I. These latter two areas are both small cities with tentative I/M plans. Medford has passed a local ordinance authorizing an I/M program, but it is subject to a referendum in March. If affirmed, the program is scheduled to start in Medford in the fall of 1984. In Spokane the State included a commitment to implement I/M in the 1979 revision of its State Implementation Plan, if Spokane remained in nonattainment beyond 1982. Because 1983 air quality data continued to show violations, Spokane is now making plans for I/M implementation by July 1985.

Issues in Operating Programs

Recent EPA evaluations have identified three primary issues in the operating I/M programs:

1. High levels of non-compliance (in excess of 20 percent) among vehicles owners in some regionalized programs with sticker enforcement systems.

2. Low reported failure rates (less than half of design) in some decentralized programs.

3. Seemingly excessive waiver rates in some programs (waiver rates greater than 10 percent of failed vehicles).

EPA has always maintained that the most effective I/M enforcement system is usually provided by denying vehicle registration to noncomplying vehicles. However, States have been allowed to use alternate enforcement methods, as long as they were as effective as a registration denial system. Because of their popularity in safety inspection programs, many States have opted to use sticker enforcement systems in their I/M programs. In regionalized I/M programs, however, sticker systems have not worked well because of several factors:

1. In regionalized I/M programs, there are many unstickered, excluded vehicles on local streets. Therefore, it is difficult for police to determine whether an unstickered vehicle is actually a violator.

2. Stickers themselves are sometimes not designed such that violators can be easily determined.

3. Stickers are usually on the windshield, whereas the license plate (which may identify county or month of inspection) is usually on the rear of vehicle, thus confounding the comparison of the two in order to judge compliance.

4. Police are often prohibited from citing parked vehicles; therefore, the only vehicles closely examined for compliance are those stopped for other reasons.

5. Police often do not give as much priority to enforcement of inspection stickers as they could.

Some decentralized I/M programs are experiencing low reported failure rates. In evaluating I/M programs, EPA has found that the reported failure rates in decentralized I/M programs are often less than in comparable centralized programs. Part of this phenomenon may be explained by pre-inspection repairs or tune-ups. Another explanation may be that inspection personnel take shortcuts in recording inspection data and do not always report initial emissions failures which they repair and retest immediately. EPA believes that each of these arguments is valid to an extent, but that these factors should not dramatically lower the reported failure rates.

Investigations of these problems are under way to determine the causes for the low reported failure rates and identify any needed program modifications to address the problem. Such modifications could include:

1. More stringent I/M emission standards.

2. Retraining of inspection personnel on record keeping procedures.

3. Changes in inspection forms to allow better, or easier, recording of data.

Some States are reporting seemingly high waiver rates. High waiver rates are a concern because, in general, lower emissions reductions are obtained from waived vehicles. High waiver rates are often symptomatic of other problems. For instance, high waiver rates can sometimes indicate a problem with the competence of mechanics and, thus, a need for more mechanic training. Poor analyzer quality control practices in repair garages can also cause waiver rates to be high

because a mechanic, relying on an inaccurate analyzer, may inadequately repair the vehicle before it is submitted for retesting. There may also be problems, in some cases, with the procedures used in issuing waivers or in the criteria on which waivers are based. Sometimes, for instance, the waiver repair cost limit may be too low, or there may not be a provision to prevent tampered vehicles from receiving waivers.

In addition to the primary issues noted above, EPA has also noted several lesser problems in evaluating the operating I/M programs. In some cases, minor problems have been noted with analyzer maintenance and quality control procedures, especially in the area of finding and repairing system leaks. There have also been some reported problems with data collection, both in manual and automatic data collection systems.

Current EPA I/M Projects

Current EPA projects related to I/M programs can be broadly divided into three catagories:

1. Projects related to 1981 and newer vehicles.

2. Projects related to optimizing the quality of I/M programs.

3. Projects related to misfueling and tampering.

EPA presently has several I/M projects under way which relate to 1981 and newer vehicles. The overall purpose of these projects is to determine how the new technology 1981 and newer vehicles behave in use and in I/M programs. Since these vehicles will comprise a large fraction of the fleet by 1987, information from these projects will help in identifying how to optimize I/M effectiveness.

In one project, inspection data over several years from the Arizona and Seattle, Washington I/M programs are being analyzed. These I/M data are being analyzed for failure rates of the 1981 and newer vehicles overall as well as by make, manufacturer, model year, engine family, and fuel control system. In addition, vehicles which fail in one year are being tracked through later years to determine whether there are recurring problems with the same vehicles.

Another project involves analyses of data collected in the New York City taxi I/M program. Taxis in New York City are required to undergo emissions inspections thrice annually because of their rapid mileage accumulation rates. This data, therefore, will provide some insight into the in-use performance of 1981 and newer vehicles at high mileage levels.

EPA is also conducting a test program in the Washington, D.C. area to study how 1981 and newer vehicles behave in an I/M situation. This project is similar to the Portland study which was conducted in the late 1970's and examined pre-catalyst and oxidation catalyst vehicles. Vehicles (1981 and newer only) which fail the District of Columbia's I/M test are being recruited for the program. Emissions from these vehicles are then tested (using the Federal Test Procedure) both before and after repair in order to determine the amount of emissions reductions resulting from the repairs. Information from this project will enable EPA to better judge the effectiveness of I/M for the new technology vehicles.

Other EPA projects deal with optimizing the quality of I/M programs. The overall purpose of these projects is to enable States to design and operate the most effective and cost-effective programs possible. Information from these projects can be used to evaluate overall I/M programs as well as parts of programs. In addition, the strong and weak points of each program can be identified and then shared among all I/M program managers in order to allow the States to learn from each others' successes and mistakes. Last November, EPA held the first national I/M quality assurance (QA) workshop in order to provide a forum to discuss I/M QA issues. This workshop was very successful and EPA plans to schedule similar workshops in the future.

One particular project which involves QA in I/M program is the development of the National Air Audit System (NAAS). The NAAS is a cooperative effort of EPA and the States in developing a formal process whereby overall air quality programs are evaluated to assure that the commitments in the State Implementation Plans (SIP's) are being met. I/M program audits are an integral part of many SIP's and, therefore, of the NAAS. The Office of Mobile Sources is currently in the process of developing guidelines for conducting I/M audits for inclusion in the NAAS in fiscal year 1985. EPA views the I/M portion of the NAAS as particularly important to the State air agencies. In most cases, the responsibility for the I/M program in a State is shared among several agencies with the air agency often having primarily SIP oversight responsibilties and less responsibility for the operating program. In these cases, the I/M audit will provide an opportunity and process for the air agency to review I/M program operations along with EPA.

EPA is also currently involved with several projects regarding misfueling and tampering. The overall purpose of these projects is to learn more about the effects of misfueling and tampering on in-use emissions. Information

from these projects will enable EPA to better determine the relationship between the frequency of misfueling and emissions deterioration, the high altitude effects of tampering and misfueling, the extent of performance problems related to tampering and misfueling, and the differences in non-methane and methane fractions in misfueled vehicles. In addition, these projects may assist in developing procedures for determining whether in-use catalytic converters are still active and for regenerating inactive catalytic converters.

Special Aspects of I/M

Three additional I/M aspects are currently receiving special attention:

1. I/M for heavy-duty vehicles.

2. Emissions performance [207(b)] warranty.

3. High altitude problems.

I/M for heavy-duty vehicles (HDV) is not a new idea. The Portland, Oregon and Arizona I/M programs have been inspecting HDV since they began the mid-1970's. However, because the I/M requirement only involves light-duty vehicles, HDV have been excluded from many I/M programs. Nevertheless, some States have already included HDV (or at least some of them) in their I/M programs, including Connecticut, Maryland, Pennsylvania, Kentucky (Louisville), North Carolina, Indiana, Colorado, Utah, Arizona, California, Oregon, and Washington. HDV have been included historically because of equity reasons, but some States, notably New York and New Jersey, are currently considering HDV I/M as an additional source of emissions reductions in order to reach attainment by 1987.

The emission performance [207(b)] warranty program is also currently receiving special attention from both the States and EPA. Now that many States have already successfully implemented their I/M programs, they are interested in ensuring that their programs qualify for 207(b) coverage. Also EPA is in the process of finalizing a rulemaking on 207(b) (currently in steering committee review) which establishes special short tests for Ford vehicles and provides some flexibility regarding the 207(b) quality control requirements. On the latter, the new rulemaking will allow EPA to approve alternate I/M quality control procedures when a State can demonstrate that their overall quality control program is at least as effective as that required by the 207(b) regulations.

After the rulemaking is published, EPA is planning to undertake an initiative on 207(b). In that process, EPA will be developing some information documents about the 207(b) warranty and its benefits and offering to assist States, as may be necessary, in determining what, if any, changes may be needed in their I/M programs in order to meet the warranty requirements.

High altitude areas are also currently receiving some special attention from EPA. In an effort to increase the effectiveness of I/M repairs at high altitude, EPA is in the process of developing a manual which will include the high altitude performance adjustments developed by the automobile manufacturer for light-duty vehicles, light-duty trucks, and heavy-duty vehicles. The manual is being designed in a format that is usable by repair mechanics in repairing vehicles and by I/M officials in handling waivers or resolving complaints. It is hoped that the manual will be available by the early summer.

Another current high altitude effort involves developing a way to identify low altitude vehicles being sold improperly in high altitude areas. It is anticipated that EPA will try to set up a referral system with the I/M programs operating at high altitude in order to identify such cases.

Conclusion

This paper has summarized the national implementation status of I/M programs, described the current issues in operating programs, and briefly explained current EPA I/M projects and other I/M aspects receiving special attention. In summary, there are currently twenty-one operating I/M programs with another seven scheduled to be implemented by August 1984. EPA is continuing to provide technical support to State and local agencies which are implementing and operating I/M programs. EPA's major role on I/M at this time is to assist the States in optimizing the quality of their I/M programs.